Amendments to the Specification:

Please replace the paragraph beginning on page 1, line 13, with the following rewritten paragraph:

Optical fibers have caused a great innovation in global communication and made possible high-quality, large-capacity transoceanic telephone communication. It is a known technique to form a Bragg diffraction grating in an optical fiber by forming an axial refractive index distribution in the core of the optical fiber. The reflectance and the width of wavelength characteristic of the diffraction grating are determined by adjusting the period of the diffraction grating and the magnitude of a refractive-index modulation in order to use the diffraction grating as a wavelength division multiplexer for optical communication, as a narrow-band high-reflection mirror for lasers and sensors or as a wavelength-selective filter for filtering laser light rays of undesired wavelengths in a fiber amplifier.

Please replace the paragraph beginning on page 1, line 28, with the following rewritten paragraph:

It is preferable to use light having a wavelength of 1.55 μm for a long-distance communication system to reduce the attenuation of the light in a quartz fiber to a minimum. The grating constant of a diffraction grating of an optical fiber for transmitting light of 1.55 μm in wavelength must be about 500 nm. It is difficult to form such a fine structure in the core of an optical fiber. A Bragg diffraction grating is formed in the core of an optical fiber by a method including many complicated processes including a side polishing process, a photolithographic process, a holographic exposure process and reactive ion-beam etching process. Thus, the production of optical fibers provided with a Bragg diffraction grating takes too much time and results in a low yield.

Please replace the paragraph beginning on page 2, line 32, with the following rewritten paragraph:

Thus, the irradiation method using a phase mask and capable of solving those problems has become ~~deemed to be~~ attractive.

Please replace the paragraph beginning on page 11, line 4, with the following rewritten paragraph:

Therefore, the core 22A of the optical fiber 22 is irradiated with the plus first-order diffracted light beam 25B or the minus first-order diffracted light beam 25C to form a diffraction grating 24 by causing a change in the refractive index of the optical ~~fiber 2~~ fiber 22 at this pitch P.

Please replace the paragraph beginning on page 13, line 24, with the following rewritten paragraph:

Then, as shown in Fig. 2D, a second exposure step that exposes the parts of the resist film 130 corresponding to the grooves 111 in an ~~exposure P_1~~ exposure once to several times (e.g., exposure doses D1, D2, D3) according to the positions of those parts on the X-axis perpendicular to the length of the grooves 111 to expose those parts of the resist film 130 in different total exposures, respectively.

Please replace the paragraph beginning on page 16, line 17, with the following rewritten paragraph:

Then, the resist ~~film 220~~ film 230 is removed (Fig. 4E).